

Highly Integrated, Reconfigurable, Large-Area, Flexible Radar Antenna Arrays, Phase I

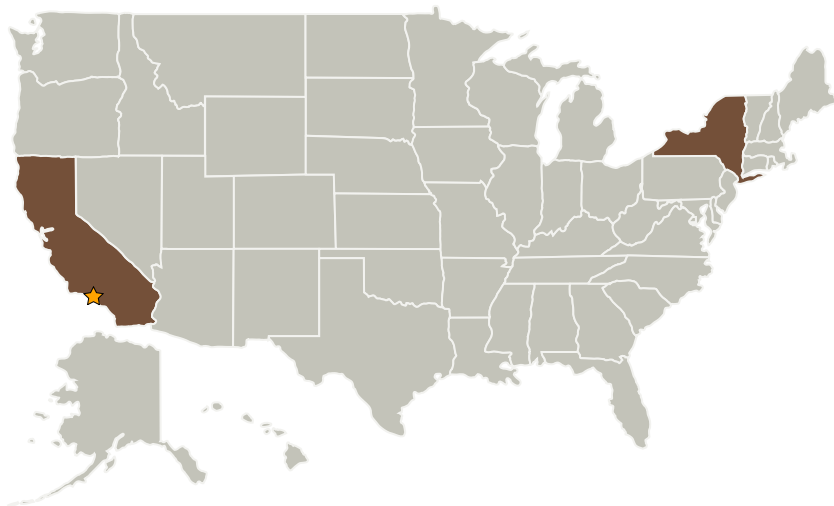
Completed Technology Project (2005 - 2005)



Project Introduction

Highly-integrated, reconfigurable radar antenna arrays fabricated on flexible substrates offer high functionality in a portable package that can be rolled up and transported on the ground, or deployed into space. High levels of integration allow for: reconfigurability of operating frequency and / or gain pattern; integration of control, information processing, and communications functions directly onto the antenna substrate; integration of MEMS sensors into the antenna substrate to monitor the system health during deployment and in service; and opto-electronic beam forming networks, providing immunity to electromagnetic interference. While the advantages of highly-integrated flexible antennas are significant, their fabrication is highly challenging due to the lack of manufacturing technologies that can meet all of the processing requirements on flexible substrates. In this program we will develop and demonstrate a lithography-based process technology that enables a variety of critical processes that cannot be carried out using existing patterning technologies, in particular: the fabrication of the radar elements and feed structures on very-large-area substrates; the reduction of manufacturing costs by using photoablation processes; high levels of integration by means of laser-crystallization, allowing for the integration of high-performance ICs; and a combination of processes to produce MEMS for on-board sensors and for reconfiguring the array.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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| Organizations Performing Work | Role | Type | Location |
|----------------------------------|-------------------------|-------------|----------------------|
| ★ Jet Propulsion Laboratory(JPL) | Lead Organization | NASA Center | Pasadena, California |
| Anvik Corporation | Supporting Organization | Industry | Hawthorne, New York |

| Primary U.S. Work Locations | |
|-----------------------------|----------|
| California | New York |

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Marc Klosner

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves